

**TAHUANTINSUYOA CHIPI,
A NEW SPECIES OF CICHLID FISH
FROM THE RIO PACHITEA DRAINAGE IN PERU**

by

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ABSTRACT. - *Tahuantinsuyoa chipi* sp. n., is distinguished from its only congener, *T. macantatzta*, by having a simple spot on the head at the posterodorsal margin of the orbit instead of an intensely pigmented caudad directed stripe from the orbit to the midline of the nape. Collections are from the Rio Pachitea drainage. Preliminary observations suggest that *Tahuantinsuyoa* species develop a bone canal through the anterior ceratohyal for the hyoid artery and this may indicate closer relationship to the Pacific versant species '*Aequidens*' *rivulatus* than to Amazonian cichlasomines. Thirteen species and three genera of fishes are known only from the Pachitea (six species, no endemic genus) or Aguaytia (four species, two genera) or both drainages (three species, one genus). Insufficient collecting in nearby rivers prevents the conclusion that the two rivers would have markedly high endemism or be particularly closely related faunistically among the Ucayali tributaries.

RÉSUMÉ. - *Tahuantinsuyoa chipi* sp.n., se différencie de *Tahuantinsuyoa macantatzta* par une tache noire simple au lieu d'une bande noire au-dessus de l'oeil. Les spécimens étudiés ont été capturés dans le bassin du Rio Pachitea au Pérou. Des observations préliminaires suggèrent que les espèces de *Tahuantinsuyoa* développent un canal à travers le cératohyal antérieur pour l'artère hyoïdienne. Ce caractère indique des relations plus proches de l'espèce '*Aequidens*' *rivulatus* du versant Pacifique que des cichlasomines amazoniens. Trois genres et treize espèces de poissons sont connus seulement des bassins du Pachitea et du Aguaytia; six espèces du Pachitea, quatre du Aguaytia et trois des deux bassins. Les collections provenant des bassins voisins sont insuffisantes, ce qui empêche de conclure à un endémisme exceptionnel ou à des relations faunistiques étroites entre les bassins du Pachitea et du Aguaytia.

Key-words. - Cichlidae, *Tahuantinsuyoa chipi*, *T. macantatzta*, Peru, Aguaytia River, Ucayali River, Taxonomy, New species.

The South American cichlid genus *Tahuantinsuyoa* Kullander (1986) was established with *T. macantatzta* as only species, based on specimens mostly collected near the village Aguaytia on the upper Rio Aguaytia, a left bank tributary of the Rio Ucayali in Peru. It is a very distinctively shaped and coloured species whose identification should pose no problem, at least not with adults.

Recent collections from the neighbouring Rio Pachitea, however, yielded specimens of a second *Tahuantinsuyoa* species which departs in head markings from *T. macantatzta*. Besides being a relief to the monotypy of *Tahuantinsuyoa*, the new species enhances the geographic and phylogenetic interest of the group.

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MATERIAL AND METHODS

The material examined, all preserved in ethanol, has been deposited in the Swedish Museum of Natural History, Stockholm (NRM), the Muséum d'Histoire naturelle de Genève, Geneva (MHNG), and in the Royal Ontario Museum, Toronto (ROM).

Comparative material includes: *Aequidens biseriatus* (Regan, 1913): NRM 12885, 3 spms, cleared and stained, Colombia, Boca de Pepé. - *Aequidens pulcher* (Gill, 1858): NRM 12886, 2 spms, cleared and stained, Trinidad, Nariva Swamp. - *Aequidens rivulatus* (Günther, 1859): NRM 10358, 11 spms, Ecuador, NW Babahoyo; NRM 13866, 9 spms, Ecuador, W Rosa Zarate; NRM 12005, 5 spms, Ecuador. - *Aequidens tetramerus* (Heckel, 1840): NRM 23163, 1 spm, cleared and stained, Brazil, Lago Janauari. - *Cichlasoma amazonarum* Kullander, 1983: NRM 23432, 2 spms, cleared and stained, Yarina Cocha. - *Tahuantinsuyoa macantzatza*: MHNG 2205.23, 3 spms, Peru, Caserio El Triunfo; MHNG 2245.47, 2 spms, Peru, Rio Huacamayo; NRM 13096, 1 spm, Peru, Rio Huipoca; NRM 13097, 5 spms, Peru, Rio Huacamayo.

Measurements and counts are taken as described by Kullander (1986). Scales in a lateral row (E1 row scales) are a count of the scale row above that including the lower lateral line. Scales in a transverse row include scales in an oblique vertical row from the anal fin origin upward and forward to the dorsal fin. Horizontal scale rows are counted from that including the lower lateral line (row 0) dorsally (rows E1, E2, etc.) and ventrally (rows H1, H2, etc.). Drawings were made using a Wild M5 drawing tube. Vertebral counts were made from radiographs made with a Philips MG-105 low voltage X-ray unit.

TAHUANTINSUYOA CHIPI SP. N.

(Figs 1-4, Tables I-III)

Tahuantinsuyoa macantzatza; (part.) Kullander, 1986, p. 309 (paratype FMNH 84273, now referred to *T. chipi*).

Diagnosis

Very similar to *T. macantzatza*, differing in having only a dark spot on the head adjacent to the posterosuperior orbital rim instead of a caudad inclined dark band connected with the translateral band posteriorly on the nape midline, and a

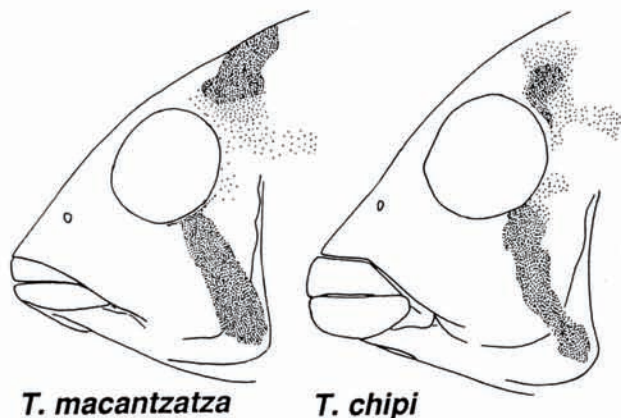


Fig. 1. - Pattern of supraorbital and suborbital dark markings in *Tahuantinsuyoa macantzatza* (from NRM 13097, 63.6 mm SL), and *T. chipi* (from NRM 12000, 70.4 mm SL).

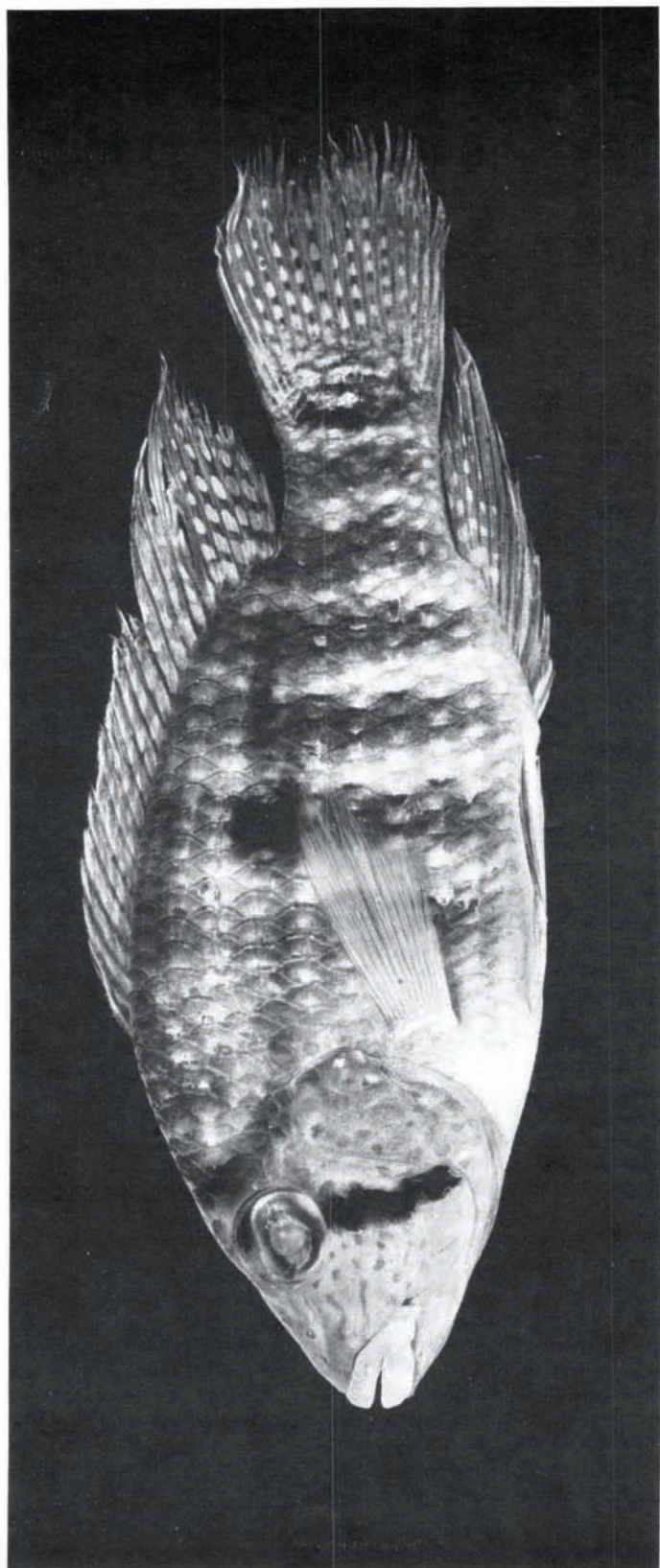


Fig. 2. - *Tahuantinsuyoa chipi*. Holotype, ROM 58725, 82.4 mm SL.

dark stripe below the eye of about uniform width instead of one which is distinctly wider ventrally (Fig. 1).

Material examined

Holotype (Fig. 2): ROM 58725. Probably a male, 82.4 mm SL, from Perú, departamento Huánuco, pools of unnamed creek close to lower Río Llullapichis, 1.8 km east of Panguana station (9°37'90"S, 74°55'90"W), 260 masl. Leg. E. Holm, B. Alvarado and F. Sang, 27 July 1988. (Station no. H88-17).

Paratypes: all from Peru, Río Pachitea drainage: ROM 57005, 4 spms, 19.1-39.5 mm, same data as holotype. - ROM 55516, 8 spms: 1, 49.6 mm and 6, 14.0-22.1 mm, Depto Huánuco, Río Llullapichis, 1.5 km W of Panguana station, leg. E. Holm and B. Alvarado, 26 Jul 1988 (H88-15). - ROM 55519, 4 spms, 16.8-34.6 mm, Depto Huánuco, Río Llullapichis, Pampa Verde ca 2 km upriver from Panguana, leg. E. Holm and F. Sang, 27 Jul 1988 (H88-18). - ROM 56124, 6 spms: 2, 69.9-81.7 mm and 4, 12.3-12.9 mm, Depto Huánuco, Río Llullapichis, pool near H88-10, 300 m E of Panguana camp, leg. E. Holm and B. Alvarado, 24 Jul 1988 (H88-12). - NRM 12000, 1 spm, 70.4 mm, Depto Huánuco, Río Llullapichis, 1.5 km W of Panguana station, leg. E. Holm and B. Alvarado, 26 Jul 1988 (H88-15). - MHNG 2394.50 (6 spms) and NRM 12003 (4 spms), 35.4-41.9 mm, Depto Pasco, Oxapampa, Río Chuchurras, tributary to Río Palcazú, Quebrada Agua Negra, leg. H. Ortega, 3 Sep 1987. - MHNG 2395.25, 2 spms, 19.1-27.1 mm, Depto Pasco, Oxapampa, Quebrada Fundo de Otto Franz, tributary to Río Iscozacín, leg. H. Ortega, 13 Sep 1987. - MHNG 2395.27, 1 spm, 40.2 mm, Depto Pasco, Oxapampa, Quebrada Cushani, Iscozacín, tributary to Río Palcazú, leg. H. Ortega, 12 Sep 1987.

Other material: FMNH 84273, 1 spm, 29.6 mm, Peru, Depto Huánuco, Río Pachitea at Puerto Inca, leg. D.W. Greenfield and G.S. Glodek, 29 Jul 1975 (G-75-70). Paratype of *Tahuantinsuyo macantatzta*.

Description

Primarily based on four specimens 69.9-82.4 mm SL. Measurements are summarized in table I. Counts are taken from 12 specimens, those of dorsal, anal and pectoral fins, EI scales and gill rakers are presented in table II. For general aspect, see figure 2. Sexual dimorphism is evident in the shape of the genital papilla and the colour pattern of the dorsal fin; females with a dark spot on the middle of the spinous dorsal fin, see below. The holotype has a genital papilla externally appearing like that of a female, but there is no evident external opening to the oviduct. Therefore I suspect that it is rather a male, also because it lacks the dark spot in the dorsal fin. The only other large male (81.7 mm) is poorly preserved; all other specimens are in good condition. A 69.9 mm specimen was partly dissected to confirm generic characters.

Moderately elongate, laterally compressed; outline in anterior view elliptic. Predorsal contour straight with slight indentation anterior to orbit, or with nape slightly curved. Dorsal and ventral outlines about equally arched. Snout long, narrower anteriorly. Jaws isognathous. Maxilla reaching to or not quite to vertical through anterior margin of orbit. Interorbital area nearly flat, narrower than mouth. Lips thick and wide, folds of upper continuous across symphysis; bilateral folds of lower lip with slightly convex free margin, narrowly separated symphyseally. Orbit in middle or mostly in anterior half of head. Subopercle short and gill cover outline decidedly sigmoid. Posteromedial wing of palatine wide but separated from lateral ethmoid by a distinct gap. Postcleithral morphology, diagnostic of *Tahuantinsuyo* *cf.* Kullander (1986), not examined.

Predorsal scales ctenoid, eight along midline but usually including irregularities and/or overlapping scale pairs; a single midline row only in four specimens. Prepelvic scales 10-11 along midline; cycloid except between pelvic fin

Table I. - Morphometry of *Tahuantinsuyoia chipi*; range, mean and standard error of mean in per cent of SL, ranges of groups of small and large fish separately; linear regression ($Y = a + Xb$) intercept (a), slope (b) and correlation coefficient (r) from mm measurements.

Measurement	38.4-49.6 mm N=7	69.9-82.4 mm N=4	38.4-82.4 mm N=11		
	%SL Min-max	%SL Min-max	%SL $\bar{x} \pm s(\bar{x})$	a	b r
Head length	34.1-36.5	33.9-36.8	35.1 \pm 0.30	0.423	0.343 0.996
Snout length	7.6-8.9	10.2-10.8	9.1 \pm 0.34	-1.802	0.128 0.996
Body depth	38.5-39.6	38.9-41.9	39.5 \pm 0.34	-1.189	0.419 0.998
Orbital diameter	11.9-13.3	10.9-12.2	12.4 \pm 0.29	1.552	0.093 0.993
Head width	16.9-17.8	16.7-18.2	17.4 \pm 0.13	0.122	0.172 0.996
Interorbital width	8.3-8.8	9.1-9.8	8.9 \pm 0.16	-0.748	0.104 0.996
Preorbital depth	4.9-6.3	7.7-8.0	6.5 \pm 0.37	-1.998	0.105 0.996
Caudal peduncle depth	15.3-16.3	15.9-16.8	16.0 \pm 0.14	-0.471	0.170 0.998
Caudal peduncle length	14.3-16.2	14.1-14.4	14.8 \pm 0.20	0.754	0.133 0.996
Pectoral fin length	27.8-29.9	27.4-29.6	28.7 \pm 0.23	0.210	0.283 0.996
Pelvic fin length	27.1-28.4	29.1-32.5	28.9 \pm 0.54	-2.408	0.338 0.994
Last D spine length	15.0-17.7	15.2-17.2	16.5 \pm 0.31	0.416	0.156 0.981

Table II. - Meristic variation in *Tahuantinsuyoia* species; absolute frequencies, modes in boldface.

Species	D					A			P			El scales			Rakers		
	XIII 11	XIV 12	XV 10	XV 11	XV 10	III 7	III 8	III 9	13	14	15	24	25	26	5	6	7
<i>T. chipi</i>			1	10	1	4	8		2	9	1	12				6	6
<i>T. macantatzta</i>	1	1	8	12	2	5	18	1	16	8		2	21	1	1	18	2

bases. Cheek scales in three rows in all specimens; cycloid except posterodorsal scales. Opercular scales in two rows; ctenoid: Three subopercular scales in a single row; two lower scales ctenoid, upper scale cycloid. Three cycloid interopercular scales in single row. Circumpeduncular scale rows 16; scales in transverse row 8+1+2½. Scales between dorsal fin and upper lateral line 3 anteriorly, 1½ posteriorly. Lateral line scales 16/10(1), 17/9(7), 18/8(1), 18/9(3). Caudal fin squamation concave, extending to middle of fin marginally, to about 1/3 of fin axially. Accessory caudal fin lateral lines including up to 8 tubed scales; upper between rays D2 and D3 in four of five specimens, between rays D1 and D2 in one specimen; lower between rays V4 and V5 in four of five specimens, between rays D3 and D4 in one; not present or not examinable in seven specimens. Fins other than caudal fin naked.

First dorsal spine 1/3 to over half length of last; spines subequal in length from 5th or 6th, but last two again longer. Soft dorsal fin ending in a blunt tip, reaching to about 1/3 to halfway the caudal fin. Soft anal fin pointed, reaching to 1/4 to 1/3 of caudal fin. Pectoral fin rounded; fourth ray longest, extending to vertical from genital papilla. Pelvic fin pointed; first ray with or without slight prolongation, reaching at most to base of third anal spine. Caudal fin subtruncate.

Gill filaments short. Externally on first gill arch, a short gill raker on branchiosuspensorial velum, one in angle and 6-7 short blunt rakers on ceratobranchial. Microbranchiospines present externally on second to fourth arches, but rudimentary and barely visible in small specimens.

Lower pharyngeal tooth plate (Fig. 3) massive, slightly wider than long. Anteriormost teeth subconical; posteriorly gradually more compressed and with more prominent posterior antrorse cusp; medioposterior teeth coarser and with rounded cusp tending to a central position. Especially median teeth with signs of abrasive wear. Right ceratobranchial 4 with two tooth plates, the posterior small and with two teeth, the anterior long and with 17 teeth.

Oral jaw teeth conical with recurved tips. Outer row teeth in upper/lower jaw hemiseries 10-20/11-18, running along half of lower jaw, and almost entire upper jaw. Teeth of outer row larger than those of inner band; more or less fixed

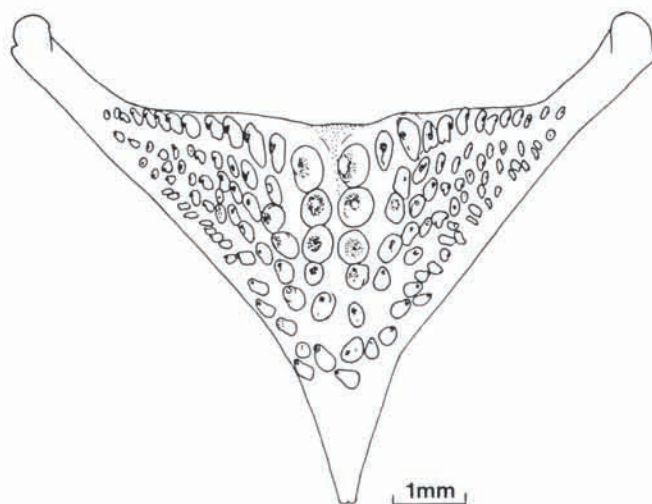


Fig. 3. - *Tahuantinsuyoa chipi*. Lower pharyngeal tooth plate in occlusal view. From ROM 56124, 69.9 mm SL.

and increasing in size anteriorly. Anteriormost teeth more or less abraded on lingual face. Inner teeth uniform in size and more or less depressible, in 2-3 rows anteriorly, forming band widening near symphysis.

Vertebrae 12 + 15(1), 13 + 14(1); four vertebrae within caudal peduncle; no parhypural spine evident.

Coloration in alcohol

Ground colour yellowish white, countershaded to brownish on back. Back above E3 scales brownish with slight pigmentation intensifications where bars ascend. Scales on sides with narrow black margin and pale dot at base of exposed part. Chest and belly dirty white. Some specimens with silvery sheen on gill cover and anterior sides. Snout grey dorsally; lachrymal, lips, lower jaw, gill cover, preopercle and branchiostegal membrane light grey. Cheek brownish yellow.

Black stripe of same width as pupil, from posteroventral margin of orbit obliquely and slightly curved to posterior corner pore of preopercle. No interorbital stripe or light preorbital stripe. Brownish black spot adjacent to posterosuperior margin of orbit, contiguous with brown stripe along dorsal margin of opercle. In holotype numerous small dark dots scattered over opercle, subopercle and upper half of cheek; small dark dots and wavy lines on lachrymal; in the others stripes and dots restricted to lachrymal and adjacent cheek. The smallest specimen in which buccal stripes can be traced is 49.6 mm.

Six vertical bars: bar 1 posteriorly, bar 2 anteriorly on caudal peduncle; bars 3 and 4 above anal fin, bars 5 and 6 above abdomen; bars increasing in pigment intensity caudad, reaching down to H3 scales, bars 4 and 5 faint dorsal to E3 scales, and bar 6 not extending above E2 scales. Lateral band brownish, indistinct, continuing opercular band on E1 and E2 scales, ending on bar 6; continued behind midlateral spot, more distinctly from bar 4 to bar 3 along overlaps of E2 and E3 scales.

Midlateral spot round or squarish, black, positioned in bar 5, on upper half or 1/3 of E1 scales 8-9 and up to include E2 scales, occasionally also lower 1/3 of E3 scales.

Dorsal fin greyish, lappets white; each interspinous membrane with three or four light, horizontally orientated bars in succession, forming rows of light stripes

along fin; soft part with white dorsal margin, otherwise grey with large oval hyaline dots. Anal fin grey, ventral margin dark grey, round hyaline dots on posterior 2/3 of soft portion. On base of caudal fin a black spot, extending as a narrow bar between rays D7 and V1, not distinctly light margined; remaining part of scaled caudal fin base marbled with whitish and brown; the remaining part of the caudal fin grey with large oval hyaline dots except along ventral margin. Pelvic fin grey, lighter medially. Females 70.4 and 69.9 mm with dark spot in the dorsal fin formed by enhanced grey interspaces between middle two light horizontal bars that extend between dorsal spines 9 and 10 or 7 and 8; and fewer light spots in soft parts of unpaired fins.

Young differ from adults in having fewer spots on fins and lacking buccal stripes and spots. Palcazú specimens notably have vertical bars fainter than the lateral band, and the anterior portion of the lateral band is as intensely pigmented as the midlateral spot and the posterior portion of the band.

Distribution (Fig. 4)

Collections are from the Rio Pachitea at Puerto Inca and from the Rio Llullapichis at Panguana, and from the lower Rio Palcazú.

Ecology

Table III summarizes catalogue data for collections by E. Holm *et al.* No information is available for the other paratypes. Many juveniles, 12.3-22.1 mm, were collected in late July, which suggests that this period falls within the reproductive season of this species.

Table III. - Habitat characteristics of *Tahuantinsuyoa chipi* collected by E. Holm *et al.*

Station	Type	Width	Depth	Substrate	Velocity	Temp	Transparency	Method
H88-12	pool	5 m	0.4 m	silt, rubble, sand, gravel	still	----	clear to bottom	rotenone
H88-15	river	3 m	0.4 m	mostly rubble, some gravel, sand, silt	0.6m/s	----	clear to bottom	rotenone
H88-17	pools	3 m	1 m	rubble, silt	still	25°C	0.6 m	rotenone
H88-18	river	25 m	1.2 m	sand, silt	still	28°C	0.4 m	seine

Etymology

The species epithet, the Shipibo word for sister (Villarejo, 1979), is used here as a noun in apposition and referring to the close, next-river, geographic relationship with the only known congener *T. macantzatza*.

DISCUSSION

Tahuantinsuyoa chipi conforms in most characters listed by Kullander (1986, pp. 308 and 320) as distinguishing *T. macantzatza* from similar cichlids, particularly *Bujurquina* Kullander, *Krobia* Kullander and Nijssen, the '*Aequidens*' pulcher group and the '*A. rivulatus*' group.

To generic characters may be added the sexual dichromatism in the dorsal fin: females of both *T. macantzatza* and *T. chipi* have a dark spot on the middle of the spinous part of the dorsal fin. This was not very obvious in *T. macantzatza* material examined by Kullander (1986) but shows well in photos in Werner and Minde (1990) and is confirmed by reexamination of preserved specimens. Such a spot is not found in related genera *Krobia* (Kullander and Nijssen, 1989), *Bujurquina* (Kullander, 1986), *Aequidens* Eigenmann and Bray, or *Cichlasoma* Swainson (Kullander, 1986), but a similar, possibly homologous marking occurs

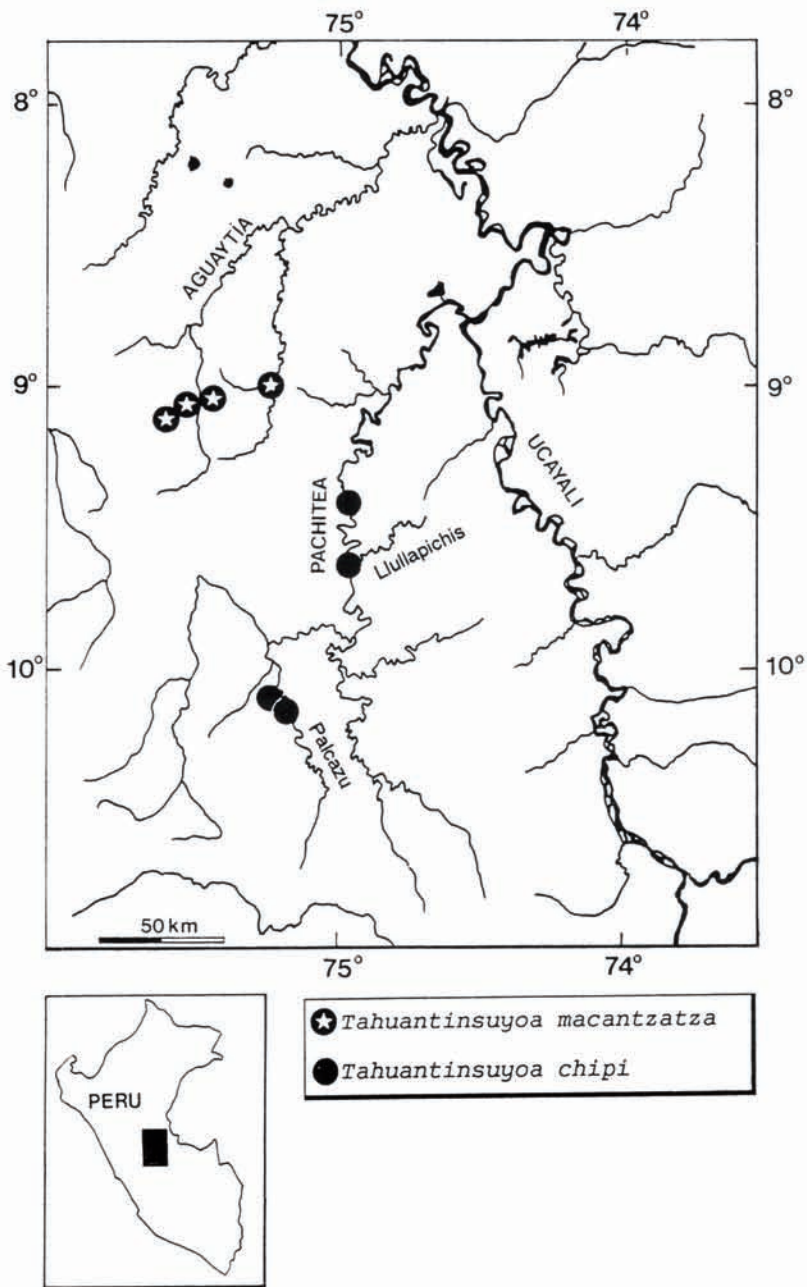


Fig. 4. - *Tahuantinsuyoia chipi* and *T. macantzatza*. Collecting localities. One symbol may cover more than one collecting site.

among species of *Laetacara* Kullander and is also frequent among Central and South American *Cichlasoma* sensu lato.

Tahuantinsuyoa chipi departs from the generic diagnosis of *Tahuantinsuyoa* in regard to ceratohyal shape and head pigment pattern.

In the 69.9 mm dissected *T. chipi* specimen the anterior ceratohyal differs from that described for *T. macantatzatza* in that the walls shielding the groove for the hyoid artery are bridged to enclose the artery in a short canal. One 61.9 mm *T. macantatzatza* also has this character, whereas four *T. macantatzatza* (63.0-70.6 mm, dissected) and smaller *T. chipi* do not. In *T. macantatzatza* there is a tough strand of connective tissue ligating the margins of the groove walls, apparently homologous to the bony bridge and perhaps ontogenetically precursory. A bone canal for the hyoid artery has otherwise been observed among cichlids only in '*Aequidens*' *rivulatus*, a Pacific coast species similar to *Tahuantinsuyoa* and *Bujurquina*. In *Bujurquina* and '*Aequidens*' *pulcher* group species the groove never seems to close up.

The hyoid morphology suggest that the hyoid artery canal in *Tahuantinsuyoa* species closes late in the ontogeny, and they may be more closely related to Pacific Ecuadorian and Peruvian '*Aequidens*' species than to Amazonian cichlasomines. The character will be discussed further in a review of the Pacific cichlasomines (Kullander, in prep.).

The original diagnosis of *Tahuantinsuyoa* included one colour marking separating the genus from *Bujurquina*. *Tahuantinsuyoa macantatzatza* has a dark, very prominent stripe running obliquely caudad and dorsad from the posterosuperior margin of the orbit to meet the translateral stripe at the dorsal midline, a little anterior to the dorsal fin. In *Bujurquina* species the corresponding marking extends anteriorly across the nape. The *Bujurquina* condition is certainly autapomorphic for that genus, whereas the *T. macantatzatza* marking corresponds to one commonly seen among cichlids.

The supraorbital stripe of *T. macantatzatza* is notable, however, since there is only one other large scaled cichlasomine genus with a corresponding marking, viz. the monotypic *Cleithracara* Kullander and Nijssen (1989), which is markedly different from *Tahuantinsuyoa* in other respects, suggesting that the similarity in head pigmentation is homoplasious. Other cichlids with this kind of supraorbital stripe are deep-bodied, small scaled cichlasomines like *Pterophyllum* Heckel and *Symphysodon* Heckel; geophagines like *Apistogramma* Regan, *Apistogrammoides* Meinken, *Papiliochromis* Kullander, *Geophagus brasiliensis* (Quoy and Gaimard) and *Biotodoma* Eigenmann and Kennedy, and also *Guianacara* Kullander and Nijssen and *Acarichthys* Eigenmann. In nearly all Central and South American cichlids with a not too depressed head (e.g. *Crenicichla* Heckel) there is some kind of more or less distinct marking at the posterosuperior margin of the orbit, a stripe slanting forward or backward or a simple blotch.

The supraorbital stripe of *T. macantatzatza* is thus an autapomorphy of that species amongst large scaled cichlasomines. In *T. chipi*, the corresponding spot at the posterosuperior orbital rim can be homologized with the *Bujurquina* marking or the *T. macantatzatza* marking or both. Although it is a more distinct marking than the supraorbital pigmentation found in most large scaled cichlasomines it is uninformative about close relationships of *T. chipi*.

Tahuantinsuyoa chipi also differs from *T. macantatzatza* in that the suborbital stripe is of uniform width whereas in *T. macantatzatza* it widens somewhat ventrally and in large specimens it expands in width toward the vertical limb of the preopercle.

Tahuantinsuyoa macantatzatza and *T. chipi* are similar in proportional measurements; the size range of *T. macantatzatza* measured (Kullander 1986, table 25, 45.7-74.4 mm) is in the gap of the size range of *T. chipi* available, but no major differences are suggested by available information. Counts are fairly in agreement except that *T. chipi* may average one more pectoral fin ray.

Thus, the pigment pattern of the head, which strongly influences the appearance, is the only important character distinguishing these two allopatric species. A stripe through the eye might be explained as a disguising colour pattern masking the eye or dissolving the head outline to predators that strike at the head or eye (Barlow, 1972). If so, *T. macantzatza* has responded to predation in a way significantly changing its overall appearance, which likely has consequences for its social behaviour in which colour markings probably play an important role as they do in other cichlids (Ohm, 1960). Thus the supraorbital stripe seems to reflect clear evolutionary separation of *T. macantzatza* from *T. chipi*.

The Pachitea and Aguaytia rivers are parallel tributaries of the Rio Ucayali. Both are relatively well collected. The Aguaytia drainage is readily accessible by road. The Rio Pachitea is accessible by road from Pucallpa to Tournavista and has a biological research station, Panguana, at the mouth of the Rio Lullapichis, that has been visited by several fish collectors. Several endemic fishes have been described from one or both rivers: the cichlids *Aequidens patricki* Kullander, *Bujurquina hopphrys* Kullander and *B. megalospilus* Kullander (1986) from both drainages, the callichthyid *Corydoras panda* Nijssen and Isbrücker in the Pachitea (Nijssen and Isbrücker, 1986), the loricariids *Crossoloricaria rhami* Isbrücker and Nijssen (1983b), *Aposturisma myriodon* Isbrücker *et al.* (1983) and *Aphanotorulus frankei* Isbrücker and Nijssen (1983a) in the Aguaytia. The latter two species represent monotypic genera. Other groups in the area are still little studied, but Eigenmann and Allen (1942) list the pimelodid *Pimelodus leptus* Eigenmann and Pearson, the loricariid *Chaetostoma lineopunctatum* Eigenmann and Allen, and the characids *Moenkhausia simulata* Eigenmann and *Knodus megalops* Myers, which still seem not to have been collected outside the Rio Pachitea drainage.

It may seem that the two rivers are faunistically related and have a relatively high endemism for their small discharges. However, very little collecting has been done in other Ucayali tributaries and it would be futile to speculate further on this issue before more collections from the many Ucayali tributaries are available.

Additional notes on *Tahuantinsuyoa macantzatza*

The paratype series of *T. macantzatza* includes a small specimen (FMNH 84273, 29.6 mm) from the Rio Pachitea at Puerto Inca which judging from notes should rather be determined as *T. chipi*. The specimen was not available for reexamination, and is thus not included in the *T. chipi* type series. As the supraorbital marking is well differentiated even at this small size, separation of the two species should pose no problem. Only one preserved sample of *T. macantzatza* has appeared since the original description. It comes from the same area as the bulk of the type material (MHNG 2395.10. 5, ca. 23.6-63.8 mm. Rio Huacamayo near Aguaytia. 1984. P. de Rham).

Werner and Minde (1990) reported on the sexual dimorphism and breeding behaviour of aquarium kept individuals of *T. macantzatza*, originally collected in the Rio Huipoca, a tributary of the Rio San Alejandro. According to Werner and Minde's observations, *T. macantzatza* is a biparental mouth brooder that deposits 30-60 eggs on a transportable substrate and mouth brood the larvae from hatching after about two days. This behaviour is similar to that of *Bujurquina* species.

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